

Health Consultation

Interstate Coatings Seattle, King County, Washington

August 10, 1999

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**Prepared by
The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**



FOREWORD

The Washington State Department of Health (DOH) has prepared this Health Consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This Health Consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this Health Consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. The Health Consultation allows DOH to respond quickly to a request from concerned residents for health information on hazardous substances. It provides advice on specific public health issues. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

For additional information or questions regarding DOH, ATSDR or the contents of this Health Consultation, please call the Health Advisor who prepared this document:

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Background and Statement of Issues

As part of the cooperative agreement with ATSDR, the Washington State Department of Health (DOH) was asked to evaluate the potential impacts on human health in the South Park community due to the presence of multiple industries in the area. The petitioner, the Community Coalition for Environmental Justice (CCEJ) worked with the community to prepare a list of sites of concern. One of the sites listed was Interstate Coatings, Inc. Using the current available data, this health consultation evaluates potential human health effects resulting from operations at Interstate Coatings.

Site Background

Interstate Coatings is a commercial painting firm that works predominantly on bridges, electrical towers, and other large structures. Most of their work is done at off-site locations outside of the South Park area. The facility in South Park is about 1 acre in size and is used as a business office, an area for truck/equipment repair and storage, and parking.¹ Located at the intersection of South Chicago and 8th Avenue South, the facility is approximately 200 feet from Duwamish River, separated only by Portland Avenue on the north. The west side of the site is separated from other light industrial tenants (a trucking company) located on the same property by a chain link fence. Properties to the south of the site are residential or occupied by small businesses. East of the site, on the other side of 8th Avenue South, is a large marine shipyard. As the majority of the property at Interstate Coatings is below sea level, a sump pump is used to pump rainfall, and other liquids generated on-site, from the yard to the street where it then drains into a sanitary sewer. This sewer goes to a treatment facility.² There are no drains on the property.

In 1991, Interstate Coatings was added to the Department of Ecology (DOE) database of known or suspected contaminated sites. In March 1998, the Seattle-King County Department of Public Health (SKCDPH) conducted a site hazard assessment for DOE. Interstate Coatings was ranked using the Washington Ranking Method Scoring Manual guidelines to determine actual or potential threats to human health. Interstate Coatings was given a ranking of three which is considered to be of intermediate concern to DOE.³

On May 19, 1999, a site visit was conducted by the Washington State Department of Health.¹ The Interstate Coatings Safety and Health manager explained that since the original DOE visit in 1990, Interstate Coatings had paved much of the yard and no longer does on-site work, except for maintenance of trucks and equipment. It was explained that an underground storage tank (UST) had been removed in September 1998. No visible contamination was evident at the site, although there were several areas where contamination was likely to have occurred, including areas where diesel fuel and oil were likely to have dripped from parked trucks onto gravel areas of the property. Less than five drums of oil and antifreeze are stored on the property and the manager explained that Interstate Coatings has recently removed many old hazardous waste drums. This year Interstate Coatings hopes that the company will be considered a small quantity generator of hazardous waste.

Community Concerns

From 1979 through 1996, approximately ten nuisance complaints were made to the Puget Sound Clean Air Authority (PSCAA) (formerly known as the Puget Sound Air Pollution Control Agency) regarding sandblasting and spray painting that were occurring on Interstate Coatings property.⁴ In June of 1996, PSCAA determined that without reasonable control measures to prevent fugitive dust emissions, which may include a permitted baghouse, and a permitted enclosure for spray painting, the property could not be used for these purposes. Since Interstate Coatings did not have the appropriate control technologies and permits, they were told to cease all such activities. Since 1996, there have been no reports of sandblasting or spray painting at the South Park facility.⁴

Environmental Contamination

In May 1998, as part of the site hazard assessment, SKCDPH collected three soil samples from Interstate Coatings.³ Soil samples were taken at a depth of approximately 6 to 7 inches below ground surface.² Sample 1 was collected by the storm drain sump pump in the yard. The unpaved region encompassing the area where sample 1 was collected is approximately 1 ft (feet) wide by 4 ft long. Sample 2 was collected at the drum storage area in the northeast corner of the yard. This is a gravel area of approximately 8 ft by 10 ft. Sample 3 was collected at the area where old sandblast grit was stored. Sample 3 was collected in the far northeast corner of the yard and access to this area is limited due to the presence of stored equipment. Currently, there are two large shipping containers stored on this gravel/mixed grass region leaving an exposed area of approximately 5 ft by 10 ft.

All samples collected by SKCDPH were analyzed for Total Petroleum Hydrocarbons Diesel (TPH-D), metals, and volatile organic compounds (VOCs).³ VOCs were not detected in any samples. The levels of metals and TPH-D that were detected above Model Toxics Control Act (MTCA) method A cleanup levels are shown in Table 1.

Table 1. Contaminants detected at Interstate Coatings in May 1998.

Contaminant	Concentration (ppm)	Sample number	Comparison Value (ppm)	Source of Comparison Value
TPH-D	1800	3	200	MTCA A
Lead	470 370	1 2	250	MTCA A
Arsenic	76 73	2 3	20	MTCA A
Chromium	360	3	100	MTCA A

ppm = parts per million

MTCA A = Model Toxics Control Act Method A

In September 1998, an UST that was previously used to store gasoline was removed from the west side of the yard at Interstate Coatings. A site assessment was conducted in October 1998 to evaluate the extent of a petroleum release from the UST. Post-excavation analytical results showed that a release, assumed to be related to overspill during filling of the tank had occurred.⁵ Approximately 30 cubic yards (36 tons) of petroleum contaminated soils were removed from the site. Further investigation has determined that there are approximately 340 cubic yards of contaminated soils remaining in the yard. Analysis showed that of 10 soil samples taken in the yard surrounding the storage tank, no detectable concentrations of TPH, toluene, ethylbenzene, or xylenes were measured. Benzene was detected at concentrations above the MTCA A cleanup level in two soil samples.⁵ Benzene levels detected were 1.84 ppm and 1.08 ppm. Results indicated that the benzene concentrations above cleanup levels were between a depth of 6 to 9 feet below ground surface.⁵ In a single groundwater sample, taken from an area below impacted soils, only xylene was detected and the measured levels were below MTCA A cleanup values. From this investigation, it does not appear that groundwater has been impacted by the leakage from the UST.

Discussion

The preliminary contaminants of concern at Interstate Coatings are: TPH-D, lead, arsenic, chromium, and benzene. All these contaminants are present in soil. The unpaved gravel areas where these contaminants are located are small in size and adverse health effects resulting from exposures due to wind blown dust from these areas are not expected.

TPH-D

TPH is a term used to describe a broad family of several hundred chemical compounds that originally come from crude oil.⁶ TPH contamination is widespread as today's society uses many petroleum-based products. TPH released in soil may move from the soil to groundwater, where individual compounds may then separate from the mixture depending on their chemical characteristics. Individual compounds may also evaporate to air. To understand how a TPH mixture will partition in the environment, it is necessary to have knowledge of the individual components in the mixture. The TPH detected at Interstate Coatings are diesel (TPH-D). The diesel fraction has a relatively low volatility, thus it will not evaporate to air easily. TPH-D mixtures usually contain no benzene and have a lower level of polycyclic aromatic hydrocarbons than other TPH mixtures. TPH-D therefore has a relatively lower toxicity than other TPH mixtures.

DOE is currently revising interim guidelines to address TPH cleanup levels. Currently, to address TPH toxicity, DOE recommends using an appropriate surrogate compound.⁷ For the TPH fraction identified at Interstate Coatings, this surrogate is n-hexane. n-Hexane is not classified as a carcinogen, but inhalation can cause reversible nerve disorders including numbness, muscle

weakness, and peripheral neuropathy. These effects have been documented in humans that were exposed to 58 ppm hexane for over 6 years.⁸ Adverse health effects in humans have not been documented after exposure through ingestion. A no adverse effect level (NOAEL) for neurological effects, via ingestion, was 1000 mg/kg/day.⁸ This dose is over one million times higher than the level a worker at Interstate Coatings would be exposed to. Calculations for the determined worker exposure levels can be seen in Appendix A. ***TPH-D exposure at Interstate Coatings is not expected to cause any adverse health effects.*** The yard at Interstate Coatings is fenced around its perimeter and TPH-D was only detected in the far northeast corner of the property, where worker or trespasser exposure is unlikely. Based on the limited sampling data that is available, and the improbability of exposure, the levels of TPH-D identified would not be expected to have any adverse impacts on the South Park community.

Lead

Lead was detected at two areas in the yard at Interstate Coatings. Since the yard is completely fenced and the only persons who would be exposed to this contamination are workers in the yard, Interstate Coatings would reasonably be determined to be an industrial site. On an average day, there are one to five workers in the yard area. Industrial soil cleanup levels are based upon an adult worker exposure scenario and are developed to protect potentially exposed employees. For lead, the MTCA A cleanup level for industrial soils is 1000 ppm.⁹ The maximum lead level detected at Interstate Coatings was 470 ppm. As the lead levels are below industrial cleanup levels, and off-site exposures from this soil contamination are not expected to occur, lead will not be considered a contaminant of concern at this site.

Arsenic

Arsenic was also detected at two areas in the yard at Interstate Coatings. Since the yard is completely fenced, the only persons who would be exposed to this contamination are workers in the yard and Interstate Coatings would reasonably be determined to be an industrial site. For arsenic, the MTCA A cleanup level for industrial soils is 200 ppm.⁹ The maximum arsenic level detected at Interstate Coatings was 76 ppm. As the arsenic levels are below industrial cleanup levels, and off-site exposures from this soil contamination are not expected to occur, arsenic will not be considered a contaminant of concern at this site.

Chromium

Chromium was detected only at the far northeast corner of the Interstate Coatings property. Since the yard is completely fenced, the only persons who would be exposed to this contamination are workers in the yard. Considering the location where chromium was detected, frequent worker exposure is not expected. Interstate Coatings would reasonably be determined to be an industrial

site. For chromium, the MTCA A cleanup level for industrial soils is 500 ppm.⁹ The maximum chromium level detected at Interstate Coatings was 360 ppm. As the chromium levels are below industrial cleanup levels, and off-site exposures from this soil contamination are not expected to occur, chromium will not be considered a contaminant of concern at this site.

Benzene

Benzene was detected in soils below a paved ground surface and the contamination does not appear to be spreading into groundwater or surrounding soils. Human exposure to this benzene contamination is unlikely. Since there is not a completed exposure pathway, benzene will not be considered as a contaminant of concern in this health consultation.

Chemical Exposure and Children

Children can be uniquely vulnerable to the hazardous effects of many environmental toxicants. When compared to adults, pound for pound of body weight, children drink more water, eat more food, and breathe more air. Children have a tendency to play closer to the ground and often put their fingers in their mouths. These factors lead to an increased exposure to toxicants in dust and soil. Additionally, before birth, the fetus is highly sensitive to many chemicals that may cause organ malformations and even premature death. For these reasons, it is very important to consider the specific impacts that contaminants may have on children, as well as other sensitive populations.

The yard at Interstate Coatings is completely fenced and relatively small. Additionally, the site does not contain any equipment that would attract children to the property. Trespassing at the site seems unlikely. As discussed above, off-site exposures resulting from on-site soil contamination are not expected to occur. ***It is therefore unlikely that children would be vulnerable to hazardous effects resulting from contaminants at Interstate Coatings.***

Conclusion

No apparent public health hazards exist at Interstate Coatings. Evaluation of the available relevant information indicates that the current exposure level is not expected to cause any adverse health impacts on the site or in the South Park community.

Recommendation

- ☐ As Interstate Coatings does not pose a public health hazard, no actions are recommended at this time.

However, if data become available suggesting that human exposure to hazardous substances at levels of public concern is occurring, or has occurred in the past, DOH will reevaluate the available data.

References

1. Site visit to Interstate Coatings by Nancy Beck, DOH, conversations with Mark Wilk, Interstate Coatings Safety and Health Manager, Seattle, Washington. May 1999.
2. Conversations with Carsten Thomsen, Seattle-King County Department of Public Health, and the Seattle Street Use Permit Counter, July 1999.
3. Seattle-King County Department of Public Health Interstate Coatings Site Hazard Assessment Summary Score Sheet. Aug 8, 1998 update.
4. Puget Sound Air Pollution Control Authority, Document files for Interstate Coatings.
5. Environmental Management Resources, Inc., UST Decommissioning and Site Characterization Report: Interstate Coatings, Inc, December 1998.
6. Agency of Toxic Substances and Disease Registry. Toxicological Profiles for Total Petroleum Hydrocarbons (TPH). Draft September 1998.
7. Washington State Department of Ecology, Interim Interpretive and Policy Statement: Cleanup of Total Petroleum Hydrocarbons (TPH), Ecology Publication # ECY97-600, January 1997.
8. Agency of Toxic Substances and Disease Registry. Toxicological Profiles for Hexane, Draft September 1997.
9. Washington State Department of Ecology, The Model Toxics Control Act Cleanup Regulation, Chapter 173-40-340 WAC, Publication # 94-06, January 1996.

CERTIFICATION

This Health Consultation for the Interstate Coatings Incorporated Site was prepared by the Washington Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

Technical Project Officer
Superfund Site Assessment Branch (SSAB)
Division of Health Assessment and Consultation (DHAC)
ATSDR

The Division of Health Assessment and Consultation, ATSDR has reviewed this health consultation, and concurs with its findings.

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Appendix

A. Exposure Assumptions

In the analysis conducted in this consultation, adults were assumed to be exposed to TPH through ingestion using an occupational exposure scenario. Exposure analysis was conducted using the formulas shown below.

$$\text{Exposure Dose} = (\text{Cs} \times \text{IR} \times \text{EF} \times \text{ED}) / \text{BW} \times \text{AT}$$

Cs = concentration of contaminant in soil (ppm)

IR = Ingestion Rate

For adults an ingestion rate of 50 mg soil/day is assumed.

EF = Exposure Frequency (days/year)

It is assumed that workers were exposed for 250 days/year.

ED = Exposure Duration (years)

It was assumed that workers were exposed to contamination for 30 years.

BW = Body Weight (kg)

For adults a 70 kg body weight is assumed.

AT = Averaging Time (days)

For noncarcinogens, this is the actual length of the exposure period.

Exposure Dose = is determined as shown above and expressed as mg/kg/day.

Glossary

Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Carcinogen	Any substance that can cause or contribute to the production of cancer.
Comparison value	A concentration of a chemical in soil, air or water that, if exceeded, requires further evaluation as a contaminant of potential health concern. The terms comparison value and screening level are often used synonymously.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Dose	A dose is the amount of a substance that gets into the body through ingestion, skin absorption or inhalation. It is calculated per kilogram of body weight per day.
Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short term (acute) or long term (chronic).
Groundwater	Water found underground that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater often occurs in quantities where it can be used for drinking water, irrigation, and other purposes.
Hazardous substance	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
Ingestion rate	The amount of an environmental medium which could be ingested typically on a daily basis. Units for IR are usually liter/day for water, and mg/day for soil.
Media	Soil, water, air, plants, animals, or any other part of the environment that can contain contaminants.
Model Toxics Control Act (MTCA)	The hazardous waste cleanup law for Washington State.
No apparent public health hazard	Sites where human exposure to contaminated media is occurring or has occurred in the past, but the exposure is below a level of health hazard.
No Observed Adverse Effect Level (NOAEL)	The dose of a chemical at which there were no statistically or biologically significant increases in frequency or severity of adverse effects seen between the exposed population and its appropriate control. Effects may be observed at this dose but were judged not to be "adverse".
Organic	Compounds composed of carbon, including materials such as solvents, oils, and pesticides which are not easily dissolved in water.
Parts per billion (ppb)/Parts per million (ppm)	Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm. 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition size swimming pool, the water will contain about 1 ppb of TCE.
Remedial investigation	A study designed to collect the data necessary to determine the nature and extent of contamination at a site.
Reference Dose	A concentration in air, soil, or water below which adverse non-cancer health effects are not expected to occur. The EMEG is a <i>comparison value</i> used to select contaminants of potential health concern and is based on EPA's oral reference dose (RfD).
Media Evaluation Guide (RMEG)	
Volatile organic compound (VOC)	An organic (carbon-containing) compound that evaporates (volatilizes) easily at room temperature. A significant number of the VOCs are commonly used as solvents.